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PATENTKANTOOR

REPUBLIC OF SOUTH AFRICA



10/519617 Certificate  
PATENT OFFICE  
REPUBLIEK VAN SUID-AFRIKA

EPARTEMENT VAN HANDEL  
EN NYWERHEID

DEPARTMENT OF TRADE AND  
INDUSTRY

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This is to certify that

REC'D 23 SEP 2003

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the documents attached hereto, are true copies of Application  
Form P1 and P2, Provisional Specification and Drawings of Patent  
Application No. 2002/5133 filed in the name of ENVIRO OPTIONS  
(PTY) LTD on the 26 June 2002 and entitled "AN AEROBIC  
DIGESTION TOILET".

**PRIORITY  
DOCUMENT**

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Signed at PRETORIA in the Republic of South Africa, this

3rd

dag van  
day of September 2003

D/D/2003  
Registrateur van Patente

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## REGISTER OF PATENTS

OFFICIAL APPLICATION NO.	LODGING DATE: PROVISIONAL		ACCEPTANCE DATE
21 02 2002 5153	22	26 June 2002	43
INTERNATIONAL CLASSIFICATION	LODGING DATE : COMPLETE		GRANTED DATE
51	23		
FULL NAME(S) OF APPLICANT(S) / PATENTEE(S)			
71	ENVIRO OPTIONS (PTY) LTD		

APPLICANTS SUBSTITUTED :	DATE REGISTERED
71	

ASSIGNEE(S)	DATE REGISTERED
71	

FULL NAME(S) OF INVENTOR(S)	72 LA TROBE, Brian Essex
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PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
N.B. Use international abbreviation for country. (See Schedule 4)	33	31	32

TITLE OF INVENTION	54 AN AEROBIC DIGESTION TOILET
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ADDRESS OF APPLICANT(S) / PATENTEE(S)
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KYA SANDS  
South Africa

ADDRESS FOR SERVICE	REF
74 John & Kernick, PO Box 3511, Halfway House, Republic of South Africa	P15186ZA00

PATENT OF ADDITION NO.	DATE OF ANY CHANGE
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61	
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FRESH APPLICATION BASED ON	DATE OF ANY CHANGE
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REPUBLIC OF SOUTH AFRICA

PATENTS ACT, 1978

APPLICATION FOR A PATENT AND ACKNOWLEDGEMENT OF RECEIPT  
(Section 30 (1) - Regulation 22)The grant of a patent is hereby requested by the undermentioned applicant AMSTE  
on the basis of the present application filed in duplicate.

REPUBLIC VAN SUID AFRIKA

MASR 370

26.6.02 R 060.00

OFFICIAL APPLICATION NO		AGENT'S REFERENCE
21	01 2002 / 5133	P15186ZA00

FULL NAME(S) OF APPLICANT(S)	
71	ENVIRO OPTIONS (PTY) LTD

ADDRESS(ES) OF APPLICANT(S)	
	Unit 45, APD Industrial Park Cnr. Elsecar & Kelvin Street KYA SANDS South Africa

TITLE OF INVENTION			
54	AN AEROBIC DIGESTION TOILET		
THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P2 The earliest priority claimed is			
THIS APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO.		21	01
THIS APPLICATION IS FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO.		21	01

THIS APPLICATION IS ACCCOMPANIED BY :	
<input checked="" type="checkbox"/>	1a A single copy of a provisional specification of 7 pages.
<input type="checkbox"/>	1b Two copies of a complete specification of 7 pages.
<input type="checkbox"/>	2a Informal drawings of sheets.
<input checked="" type="checkbox"/>	2b Formal drawings of 1 sheets.
<input type="checkbox"/>	3 Publication particulars and abstract (form P8 in duplicate).
<input type="checkbox"/>	4 A copy of figure of the drawings for the abstract.
<input type="checkbox"/>	5 Assignment of invention (from the inventors) or other evidence of title.
<input type="checkbox"/>	6 Certified priority document(s).
<input type="checkbox"/>	7 Translation of priority document(s).
<input type="checkbox"/>	8 Assignment of priority rights.
<input type="checkbox"/>	9 A copy of form P2 and a specification of S.A. Patent Application.
<input type="checkbox"/>	10 A declaration and power of attorney on form P3.
<input type="checkbox"/>	11 Request for ante-dating on form P4.
<input type="checkbox"/>	12 Request for classification on form P9.
<input type="checkbox"/>	13a Request for delay of acceptance on form P4.
<input type="checkbox"/>	13b

21 01

DATED 26 June 2002

  
Patent Attorney for Applicant(s)

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RECEIVED	
OFFICIAL DATE STAMP	
REGISTRAR OF PATENTS	

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REPUBLIC OF SOUTH AFRICA

## PATENTS ACT, 1978

PROVISIONAL SPECIFICATION  
(Section 30 (1) - Regulation 27 )

OFFICIAL APPLICATION NO.		LODGING DATE	AGENT'S REFERENCE
21	01/2002/5735	22    26 June 2002	P15186ZA00
FULL NAME(S) OF APPLICANT(S)			
71	ENVIRO OPTIONS (PTY) LTD		
FULL NAME(S) OF INVENTOR(S)			
72	LA TROBE, Brian Essex		
TITLE OF INVENTION			
54	AN AEROBIC DIGESTION TOILET		

## AN AEROBIC DIGESTION TOILET

### FIELD OF THE INVENTION

This invention relates to a toilet which provides aerobic digestion of primary sewage.

### BACKGROUND TO THE INVENTION

Toilets which provide aerobic digestion of primary sewage are known. One type makes use of a toilet bowl above a chamber having means for inducing convection flow through the chamber through heating the chamber and an outlet vent by exposure to sunlight.

Whilst effective, such toilets do suffer the disadvantage that they are fairly bulky.

### OBJECT OF THE INVENTION

It is an object of this invention to provide an aerobic digestion toilet which can be of smaller construction than existing such toilets.

### SUMMARY OF THE INVENTION

In accordance with this invention there is provided an aerobic digestion toilet including a chamber, a toilet bowl above the chamber, and means for generating radiant heat in the chamber to induce convection flow through the chamber from adjacent the floor thereof to an outlet vent from the chamber, characterised in that a conveyor is located below the toilet bowl and configured to receive material falling from the toilet bowl and move it upwardly at an incline to a tray.

Further features of the invention provide for the tray to be downwardly inclined from the conveyor; for the tray to be inclined at different angles along its length; for the tray to be inclined at an angle of about 45° adjacent the conveyor and for the remainder of the tray to be inclined at an angle of about 30°; for the tray to feed into a solids receptacle; and for the solids receptacle to removably located in the chamber.

Still further features of the invention provide for the conveyor to move in a stepwise fashion; for the conveyor to be manually moved; and for the conveyor to be operable in unison with a closure member for the outlet from the toilet bowl which is tiltable from adjacent the toilet bowl to open the outlet from the toilet bowl.

The invention also provides for the closure member to be a screen to operate by a person using the toilet.

Yet further features of the invention provide for the conveyor to be a belt conveyor, preferably a sprocket belt for the conveyor to be inclined at about 10°; and for the lowermost end of the conveyor to feed into a fluids receptacle.

BRIEF DESCRIPTION OF THE DRAWINGS

One embodiment of the invention will be described, by way of example only, with reference to the drawings in which:

Figure 1 is a sectional side elevation of an aerobic digestion toilet; and

Figure 2 is a sectional end elevation of the aerobic digestion toilet in Figure 1.

DETAILED DESCRIPTION OF THE DRAWINGS

An aerobic digestion toilet (1) is shown in Figure 1 and Figure 2 and has a chamber (2) the lower part of which is sunk below ground level. A toilet bowl (3) is provided above the chamber (2).

An outlet vent in the form of a round cross-sectioned black plastics material pipe (5) has a wind turbine (6) at its upper end. This pipe (5), when exposed to sunlight, generates radiant heat within the vent resulting in upward flow of gas from the chamber (2) to atmosphere. An air inlet (not shown) may be provided from atmosphere into the chamber (2). It has, however, been found that an adequate airflow is obtained through the toilet bowl (3) assembly into the chamber (2).

The chamber (2) has a manhole and manhole cover (8) to allow access into the chamber. The cover (8) is secured by a hinge (9) to the chamber (2) and is also made as a panel of heat absorbent material to increase the radiant heat generated in the chamber.

The chamber (2) can be a built-in structure of bricks or blocks but in this embodiment is moulded in suitable plastics material. The chamber (2) is

moulded in two parts with the base (11) sunken below ground level and the cover (12) extending above ground level.

The cover (12) of the chamber (2) has a transverse trough (15) which is provided to accommodate the foundation for a wall (not shown). This is useful where it is desired to install the toilet prior to building a house or similar structure.

The chamber (2) is divided into the two parts which are joined along the flange line indicated at (16) with the bottom edge of the cover (12) nesting along the top edge of the base (11).

A pivoted closure plate (20) is mounted to keep the outlet from the toilet bowl (3) normally closed and to avoid any waste on the conveyor being visible to the user. The plate (20) is pivoted at (21) and carries an extension (not shown) on the opposite side of the pivot (21) to the plate (20). The plate (20) is connected by means of a linkage mechanism (indicated at 20A) to the toilet seat.

A conveyor (25), which includes a non-porous belt (26) running on a pair of spaced apart sprocket rollers (27), is secured within the chamber (2) at an incline of approximately 10°. The lowermost part (30) of the conveyor (25) is situated below the outlet to the toilet bowl (3). The uppermost part (31) of the conveyor (25) feeds onto a downwardly inclined tray (32).

The rod (23) is also pivotally secured to a lever (35) which operates a ratchet mechanism (36) to drive the uppermost roller (27). The rod (23) operates the conveyor by depressing the handle, which in turn rotates the ratchet mechanism to drive the belt.

The closure plate (20) sight-screen is activated by the toilet seat being depressed by a person sitting on the seat. A spring mounted linkage mechanism is connected to the underside of the toilet seat. When the toilet seat is depressed

the linkage pulls the flap to the open position. When any weight is removed from the seat, the closure plate reverts to the normal closed position.

The tray (32) is inclined at 45° adjacent the conveyor (25) and for the remainder of its length at 30°. The tray (32) feeds into a solids receptacle (40) which has a handle (41) to allow for easy removal thereof through the manhole. A spare receptacle (42) is provided in the chamber (2) and located on a shelf (43) near the top of the chamber (2).

The lowermost part (30) of the conveyor extends over a fluids receptacle (45) formed by a depression in the bottom of the chamber (2).

In use, raw sewage is deposited through the toilet bowl (3) onto conveyor belt (26) as the flap will automatically open when a user sits on the seat. Depression of the rod (23) also causes a stepwise upward movement of the belt (26).

Fluid, such as urine, deposited onto the conveyor (25) will flow downwardly off the conveyor and thence into the fluids receptacle (45). This separates liquids from fluids on entry into chamber (2). The fluid receptacle is formed by the total space below the drying plate (32). From there it will flow either through drain outlets (44) into a transpiration bed outside the unit or into an evaporation tank (not shown) also outside the unit. Solid waste remains on the conveyor (25) and is moved slowly upwardly each time the rod (23) is operated. During the time that it spends on the conveyor (25) the solid waste has time to dry. By the time that the solid waste reaches the end of the conveyor (26) and falls onto the tray (32) it is partly digested. Complete digestion takes place on the tray (32) during downward movement of the material to the solids receptacle (40). Once sufficient material has collected in the solids receptacle (40) it can be removed through the manhole and the material either used or disposed of.

The toilet is smaller than similar units of conventional construction through use of the conveyor for moving material in the chamber. This feature permits the toilet to be more compact especially in terms of its height and hence requires less excavation during installation of the unit.

It will be appreciated, however, that many other embodiments of an aerobic digestion toilet exist which fall within the scope of the invention especially as regards the construction and configuration thereof. For example, any suitable conveyor and drive means can be used. Also, additional means can be included to facilitate the evaporation or other dispersion of urine deposited in the toilet.

DATED THIS 26th DAY OF JUNE 2002



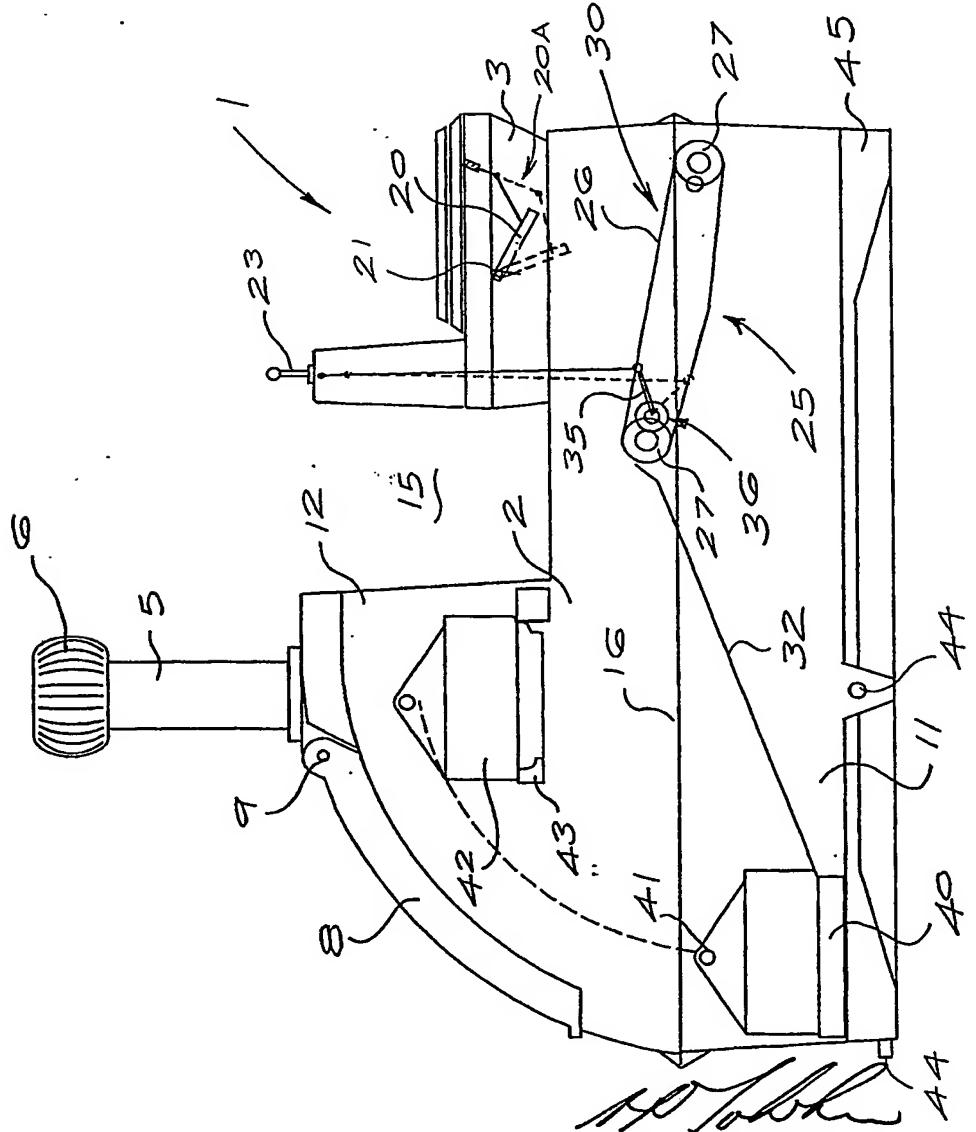
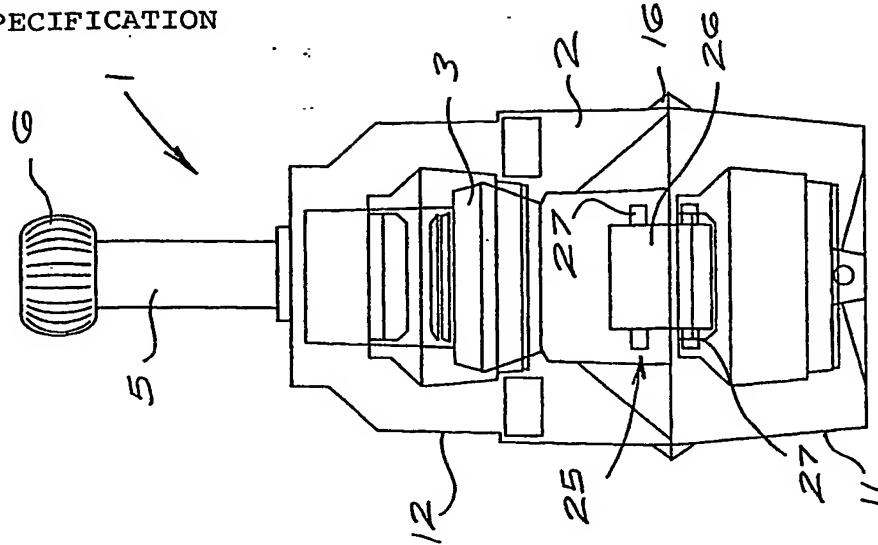
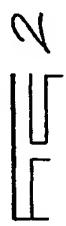
JOHN & KERNICK

FOR THE APPLICANT

2002 5133

ENVIRO OPTIONS (PROPRIETARY)  
LIMITED  
PROVISIONAL SPECIFICATION

ONE SHEET /  
SHEET ONE



~~JOHN & KERNICK  
FOR THE APPLICANT~~

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